

Figs. 1 to 9 show longitudinal sections through heads of toothbrushes of this invention.

Figs. 10A, 10B, 10C, 10D and 10E show cross sections through bundles of bristles of the toothbrush of this invention being used as radiation guides.

5 Figs. 11 and 12 show further toothbrush heads of this invention.

Figs. 13 - 16 schematically show a process by which toothbrush heads of this invention may be manufactured.

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Fig. 17 shows a schematic longitudinal section through a handle of a toothbrush of this invention.

10 Referring to Fig. 1 a toothbrush head 1 is shown. The head is detachably connectable to a handle (not shown) by means of connector means 2, which may be conventional in the art. The head 1 and the toothbrush handle are disposed along a longitudinal axis A-A. From a bristle surface 3 of the head 1 extends a cluster of bristles 4, extending in a bristle direction B-B. The head 1 is made of a mass of
15 plastic material which is transparent to radiation in the wavelength region at least between 400-600 nm. The ends 4A of the bristles 4 which are fixed into the head 1 are welded into the head 1 material as individual filaments by a state of the art process.

20 Incident radiation may be directed from a source (not shown in Fig. 1) into the head 1 from the direction of the handle, i.e. in the direction shown by the arrow 5, by means of an optical connection surface 6, being a planar surface of the transparent material of which the head 1 is made. Because of internal reflection within the transparent head resulting from the difference in refractive index between the high refractive index N_1 of the head material and the lower refractive index N_2
25 of the surrounding air, this radiation is directed through the head 1 and emerges from the head 1 via the bristle face 3, i.e. substantially in the bristle direction B-B. The radiation emerging from the bristle face 3 impinges upon the surface of a tooth (not shown) and excites fluorescence emission from biological deposits on the tooth surface and/or deposit-free tooth surfaces. This emitted radiation traveling in the
30 direction shown by the arrow 7 passes through the bristle face 3 and is collected by the transparent head 1. As before, internal reflection within the transparent head,